Case Report / Olgu Sunumu

MEDICINE PALLIATIVE CARE

DOI: 10.47582/jompac.886900

J Med Palliat Care 2021; 2(3): 102-104

A case of acute hepatitis associated with COVID-19 in a geriatric patient

Geriatrik hastada COVID-19 ilişkili akut hepatit olgusu

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Cite this article as / Bu makaleye atıf için: Bayrak M, Çadırcı K. A case of acute hepatitis associated with COVID-19 in a geriatric patient. J Med Palliat Care 2021; 2(3): 102-104.

ABSTRACT

Coronavirus 2019 disease (COVID-19) is a deadly disease that causes 44 million positive cases and over 1 million deaths worldwide. COVID-19 is a disease in which respiratory tract infectious diseases such as fever, shortness of breath, and cough are observed more frequently. It has been observed to cause liver damage in literature studies in addition to respiratory symptoms. Our case is a 77-year-old male having no systemic disease except hypertension. Fever of 38.2°C for four days, pulse 84/min, respiratory rate 18/min, blood pressure 136/82 mmHg, and oxygen saturation on room air was measured 92% by pulse oximetry. The patient who had aspartate aminotransferase (AST) 753 IU/L and alanine aminotransferase (ALT) 683 U/L in the tests in the emergency room was admitted to the infectious diseases service because of acute liver damage and the positive result of the COVID-19 PCR-RT test performed in the emergency department. The diagnosis of acute hepatitis associated with COVID-19 was made in our case, after excluding other causes of elevated liver enzymes. We aimed to contribute to the literature by presenting our case.

Keywords: Coronavirus (COVID-19), acute hepatitis, infection

ÖZ

Koronavirüs 2019 hastalığı (COVID-19) dünya genelinde 44 milyon pozitif vaka ve 1 milyonun üzerine ölüme sebep olan ölümcül bir hastalıktır. COVID-19 ateş, nefes darlığı ve öksürük gibi solunum yolu enfeksiyon hastalıkları bulgularının daha sık izlendiği bir hastalıktır. Solunumsal semptomlarının yanında literatür çalışmalarında karaciğer hasarına yol açtığı görülmüştür. Vakamız 77 yaşında erkek, hipertansiyon haricinde herhangi bir sistemik hastalığı yoktu. Dört gündür başlayan 38,2°C ateş, nabız 84/dk, solunum sayısı 18/dk, tansiyon 136/82 mmHg, oda havasında oksigen saturasyonu pulse oksimetri ile ölçümü %92'idi. Acil servisteki tetkiklerinde aspartat aminotransferaz (AST) 753 IU/L ve alanin aminotransferaz (ALT) 683 U/l olan hastanın akut karaciğer hasarı olması, acil serviste yapılan COVID-19 PCR-RT testinde pozitif olması nedeniyle enfeksiyon hastalıkları servisine yatırıldı. Vakamızda karaciğer enzim yüksekliği yapan diğer nedenler dışlandıktan sonra COVID-19 ilişkili akut hepatit olgusu tanısı konuldu. Olgumuzu literatüre sunarak katkı sağlamayı amaçladık.

Anahtar kelimeler: Koranavirüs (COVID-19), akut hepatit, enfeksiyon

INTRODUCTION

Coronavirus 2019 disease (COVID-19) is a deadly disease that causes 44 million positive cases and over 1 million deaths worldwide (1). SARS-CoV-2 Angiotensin is known to use the converting enzyme 2 (ACE2) receptor. In COVID-19 infection via the ACE2 receptor on the cell surface, it causes more respiratory symptoms but also causes effects on the liver, heart, pancreas, and intestines (2). Even people who have not had any previous disease may have impaired liver function in COVID-19 infection. They found in studies conducted in China that there was a 14-50% deterioration in liver functions in healthy people in COVID-19 patients and people with predisposing liver diseases (3,4). Liver damage of COVID-19 can occur by several mechanisms. The direct cytotoxic effect of the virus, the immune system in the liver, and the side effects of the drugs used in treatment can cause this damage. The virus causes overexpression in hepatocytes mediated by the ACE2 receptor. It initiates replication mechanisms in the cell with the ACE2 receptor and

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Received / Geliş: 25.02.2021 **Accepted / Kabul:** 19.03.2021

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makes new viral RNA synthesis, release, and protein synthesis (5-7). COVID-19 ACE2 receptors have limited effects on hepatocytes. Therefore, this limitation may explain the development of viral hepatitis and the absence of changes in liver enzymes in every patient (8). Although the virus is thought to cause damage in hepatocytes via viral cytotoxicity and the immune system, the mechanism is not fully understood. In our case, we think that we aim to contribute to the literature as a rare case by diagnosing with acute hepatitis after the sudden increase in liver enzymes with COVID-19 infection and by eliminating other pathologies that would explain this in a person who did not have any known liver damage before.

CASE

Our case is a 77-year-old male and did not have any systemic disease except hypertension. He had been using valsartan/hydrochlorothiazide (160-12.5 mg) for 11 years. 38.2°C fever for four days, pulse 84/min, respiratory rate 18/min, blood pressure 136/82 mmHg, and oxygen saturation on room air was measured 92% by pulse oximetry. The lung examination of the patient was normal on the first day of the infection service. There was no icterus in the skin and mucous membranes. There was no hepatomegaly, lymphadenopathy, splenomegaly. In laboratory tests, hemoglobin 14 g/dL (14.1-17.8), white blood cell (WBC) 7.09×10^3 ($3.91\text{-}10.9\times10^3$), platelet 285×10^3 ($152\text{-}383\times10^3$), serum reactive protein (CRP) 48.4 mg/L (0-5) mg/L), D-dimer 901 mgL (0-500 mgL, procalcitonin 0.143 ng/ml (0-0.05 ng/ml), fibrinogen 679 mg/dL (200-400 mg/dL), INR: 1.01 (08.1.2), total serum bilirubin 0.5 mg/dl (0.2-1.0 mg/dl), AST 753 u/l (0-40 u/l), ALT 683 u/l (7-40 u/l), gamma-glutamyl transferase (DDT) 26 u/l (7-50 u/l), alkaline phosphatase 74 u/l (46-116 u/l), serum albumin 3.8 mg/dl (3.2-4.8 g/dl), ferritin 514 µg/L (30-400 µg/L) (**Table**). No hepatosteatosis, thrombus, and other pathologies were observed in the abdominal and portal vein doppler ultrasonography. Viral hepatitis serological tests; hepatitis A, B, C, E, cytomegaly virus, Epstein-Barr virus, H1N1, and another respiratory virus panel were negative. Brucella serological tests were also found to be negative as a hepatitis agent. There was no growth in blood, urine, and sputum cultures. No pathology was found in thoracic tomography and echocardiography performed in terms of hypoxia and perfusion disorder. The autoimmune hepatitis panel was negative. Since the COVID-19 PCR-RT test performed in our case was positive, antiviral treatment Favipiravir 2×1600 mg loading and 2×600 mg maintenance (10 days), subcutaneous 60 mg/day enoxaparin, acetylcysteine 900 mg/day treatment were started. On the second day of the patient, AST 544 u/l, ALT 578 u/l), alkaline phosphatase 68 u/l, oxygen saturation on room air was measured 93% by pulse oximetry, 37.2°C fever, pulse 76/min, respiratory rate 16/min, blood pressure 137/84 mmHg. On the 3rd day of our case, AST 417 u/l, ALT 519 u/l), alkaline phosphatase 68 u/l, oxygen saturation on room air was measured 95% by pulse oximetry, 36.9°C fever, pulse 76/min, respiratory rate 16/min, blood pressure 132/81 mmHg. The control COVID-19 PCR-RT test was negative on the 8th day of the COVID-19 treatment of our patient. AST 52 u/l, ALT 190 u/l), alkaline phosphatase 77 u/l, oxygen saturation on room air was measured 96% by pulse oximetry, 36.5°C fever, pulse 76/min, respiratory rate 16/min, blood pressure 128/83 mmHg. Our patient's AST decreased to 30 u/l; ALT decreased to 73 u/lon the 14th day of the treatment. The change of liver enzymes in the treatment period is shown in **Figure**. Our patient, whose general condition was good and vital signs were stable, was discharged home. A written consent form was obtained for our patient to write the case.

Table. Laboratory findings of COVID-19 positive case after diagnosis and treatment

	1st Day	14th Day
Hemoglobin (g/dL) (14.1-17.8)	14.3	14.8
White blood cell $\times10^3$ (3.91-10.9)	7.09	7.16
Platelet $x10^3$ (152-383)	165	221
AST u/l (0-40)	753*	30 *
ALT u/l (7-40)	683*	73*
Albumin mg/dl (3.2-4.8 g/dl)	3.8	3,6
GGT u/l (7-50 ıu/l)	26	22
Alkaline phosphatase u/l (46-116)	74	77
Total bilirubin mg/dl (0.2-1.0)	0.5	0.42
CRP mg/L(0-5)	48.4	3.4
D-dimer mgL (0-500)	901	229
Procalcitonin ng/ml (0-0.05)	0.143	0,04
Fibrinogen mg/dL (200-400)	506	328
Ferritin µg/L (30-400)	459	358
INR	1.09	1.11
S/D ABP mmHg	136/82	127/81
SpO_2	%92	%96
GFR (ml/dk/1.73m²)	77	66

*A significant decrease in liver enzymes was observed on the 14th day of the treatment AST: Aspartate aminotransferase, ALT: Alanine aminotransferase, GGT: Gama-glutamyl transferase, CRP: C-reactive protein, INR: International normalized ratio GFR: Glomerular filtration rate, S/D ABP: Systolic/diastolic arterial blood pressure SpO_2: Peripheral blood oxygen saturation

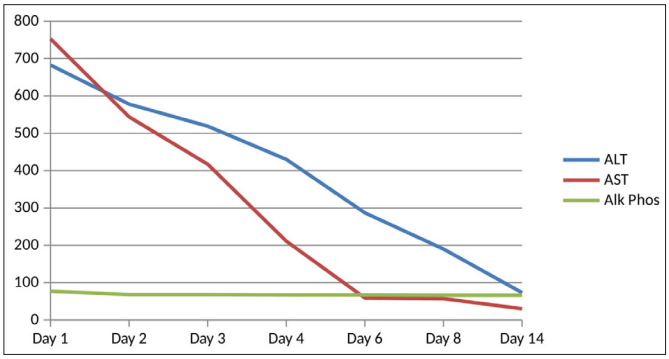

Figure. Changes in liver enzymes within days at the end of the diagnosis and treatment of the COVID-19 positive case.

DISCUSSION

COVID-19 is a disease in which respiratory tract infectious diseases such as fever, shortness of breath, and cough are observed more frequently. COVID-19 infection causes more respiratory symptomsthrough the ACE2 receptor on the cell surface but also causes effects on the liver, heart, pancreas, and intestines (2). It was first shown in the literature that it caused some histopathological changes such as hepatocyte apoptosis, mitosis, and ballooning in the liver in liver biopsy performed in the viral RNA virus SARS coronavirus infection in 2002 (9). Liver biopsy performedin a case with MERS coronavirus in 2012 showed moderate portal inflammation and perivenular necrosis. An increase inthe patient's liver enzymes was observed (10). Wander et al. (11) presented the literature in 2020 a non-icteric COVID-19-associated acute hepatitis case after excluding other causes of a sudden increase in liver enzymes in a 57-year-old COVID-19 positive patient who had no liver pathology before. Our case was an older male patient, as in this case, there was no known liver pathology before and also all other etiological reasons that would increase liver enzymes were excluded as in the other case. A dramatic decrease in liver enzyme values was also observed in our patient in our follow-ups after COVID-19 treatment. We think that although Favipiravir treatment is a hepatotoxic agent and we use high doses, no additional increase in liver values was observed in our patient, which is a finding that supports COVID-19-related acute hepatitis in our patient. In the study of Lagana et al. (12), lobular lymphohistiocytic inflammation and apoptotic hepatocytes were observed in the liver biopsy performed in a patient with positive COVID-19 PCR test performed with complaints such as fever and shortness of breath on the 4th day after liver transplantation in a 6-month-old infant with biliary atresia and increased liver enzymes. and the patient was thought to have COVvID-19 associated hepatitis. In this case, the decrease in liver enzymes after treatment was similar to our case. We consider the patient's pediatric age group, bile duct pathology, and liver transplantation surgery as factors that differ from our case. We consider the absence of liver biopsy in our case as a limitation of our study.

CONCLUSION

COVID-19 infection is a disease that affects many systems other than the respiratory tract and causes systemic symptoms. We would like to emphasize the development of acute hepatitis, which is a rare finding of COVID-19 infection, and that COVID-19 may lead to acute liver damage while following this disease by presenting the COVID-19 related acute hepatitis case. Also, we aim to contribute to the literature by presenting the rare case of COVID-19 associated with acute hepatitis.

ETHICAL DECLARATIONS

Informed Consent: Written informed consent was obtained from all participants who participated in this study.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: Article writing and editing: MB, KÇ. Table and graph drawing: MB.

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